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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/762,730	04/10/2001	Pierre Allio	72211-9013	8581

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EXAMINER	
WARD, AARON S	

ART UNIT	PAPER NUMBER
2675	6

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/762,730	ALLIO, PIERRE	
	Examiner	Art Unit	
	Aaron S. Ward	2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 April 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: TR1 and TR2, mentioned in page 12 lines 8-32 regarding Fig. 4, are not included in Fig. 4. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 1 and 12 are objected to because of the following informalities: The antecedent basis of the recitation "a said autostereoscopic image" on lines 12-13 of claim 1 is unclear.

Line 4 of claim 12 recites "lines" and it is unclear whether lines refers to rows or columns.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2 and 13-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Allio, U.S. Patent No. 5,936,607.

As to independent claim 1, Allio teaches a method of autostereoscopically displaying an N-viewpoint 0, 1, 2, 3 (Fig. 1a; col. 3 lines 33-34) image on a screen 20 having display pixels disposed in rows P1-P4 and columns (i.e., column formed by subsequent rows e.g. P5-P8; col. 3 lines 44-45), each display pixel presenting p > 1 color points (col. 3 line 42), corresponding to first, second, ..., and pth color components RGB, in which method the pixels of an autostereoscopic image to be displayed are displayed by distributing in space the p color points of each pixel amongst the color points of corresponding color components in p different display pixels (col. 3 lines 48-60), wherein, starting from a "high definition" (the pixels are high definition) autostereoscopic image presenting at least as many pixels P1-P4 each having p color points RGB as the N viewpoint 0, 1, 2, 3 image presents color points RGB of TR1-TR4, said autostereoscopic image to be displayed is generated in which each pixel TR1-TR4 is a color point of the corresponding color component of p different pixels in the high definition autostereoscopic image (col. 3 lines 48-68).

As to claims 2 and 19, the high definition autostereoscopic image presents in the row direction as many pixels TR1-TR4 each having p color points RGB as each image row presents color points P1-P4.

As to claims 13 and 22, the autostereoscopic image to be displayed, when ordered so as to interleave the pixels of the N viewpoints 0, 1, 2, 3 (Fig. 1a) making it up in accordance with its display topology, comprises groups of N pixels TR1-TR4 each of which corresponds to a different viewpoint 0, 1, 2, 3, the first pixel TR1 of a given N pixel group corresponding to a first viewpoint 0 being constituted by a first color point R0 which is the color point of the first color component of the first P1 of said p different pixels P1-P3 of a group of p pixels of the first viewpoint 0, a second color point G+1 which is the color point of the second color component of the second P2 of said different pixels P1-P3 of said group of p pixels of the first viewpoint 0, . . ., and a pth color point B+2 which is the color point of the pth color component of the pth P3 of said different pixels P1-P3 of said group of p pixels of the viewpoint 0, the second pixel TR2 of said given group of N pixels which corresponds to a second viewpoint 1 being constituted by a first color point G-1 which is the color point of the second color component of the first P1 of said p different pixels of a group of p pixels P1, P2, P4 of the second viewpoint 1, . . . , and a pth color point R+2 which is the color point of the first color component of the pth P4 of said p different pixels of the group of p pixels P1, P2, P4 of the second viewpoint, ..., and so on by circular permutation (col. 1 line 65 – col. 2 line 3) to the Nth pixel TR4 of said given group which corresponds to the Nth viewpoint 3 and to the group of p pixels corresponding thereto.

As to claim 14, the groups of N pixels TR1-TR4 are disposed in the row direction (i.e., the pixels are shifted right/left in the row per col. 4 lines 12-35).

As to claim 15, the p different pixels P1-P4 are contiguous (Fig. 1a).

As to claim 16 and 20, the p different pixels P1-P4 are aligned in the row direction (as explained above per col. 4 lines 12-35).

As to claim 17, the p color points RGB of each display pixel P1-P4 are disposed side by side in the row (as explained above regarding claims 14-16) or the column direction (i.e., column formed by subsequent rows e.g. P5-P8; col. 3 lines 44-45).

As to independent claim 18, Allio teaches an N viewpoint 0, 1, 2, 3 (Fig. 1a) autostereoscopic image presenting pixels TR1-TR4 disposed in rows (akin to P1-P4) and columns (i.e., column formed by subsequent rows e.g. akin to P5-P8; col. 3 lines 44-45), each pixel TR1-TR4 being constituted by p color points of a different color component RGB, wherein each of the p color points of each pixel TR1-TR4 is constituted by a color point of a corresponding color component RGB offset in space (displacement DPC of Fig. 1a; col. 4 lines 40-42) in the same manner for each of the p different pixels of a group of p pixels of a viewpoint (e.g., each of the color points R, G, B for a given viewpoint TR1-TR4 is separated by all three color elements RGB, not necessarily in that order) of a high definition autostereoscopic image presenting at least as many pixels having p color points RGB as the N viewpoint 0, 1, 2, 3 autostereoscopic image presents color points RGB (col. 3 lines 48-60).

As to claim 21, the different pixels are in alignment on a diagonal of said high definition autostereoscopic image (col. 4 lines 55-57).

As to claim 23, the first, second, and third color components are respectively red, green, and blue (col. 2 lines 54-55).

As to claim 24, the image being displayed or printed from an autostereoscopic image according to claim 18 in the form of display points or pixels TR1-TR4 which are obtained by distributing the p color points RGB of each pixel TR1-TR4 of said autostereoscopic image between the color points RGB of corresponding color components RGB of p different display pixels (e.g., P1-P3 for TR1; P1, P2 and P4 for TR2).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allio as applied to claim 1 above, and further in view of Fergason, U.S. Patent No. 6,184,969.

As to claim 3, Allio teaches the invention as recited in claim 1, but fails to specifically teach that the high definition autostereoscopic image is generated from a starting autostereoscopic image which presents lower definition by using a definition-increasing method, such as an interpolation method, a vectorization method, or an outline search method.

Fergason teaches an optical display system to improve resolution of a display (i.e., a definition-increasing method) used to provide an auto-stereoscopic output. Fergason teaches the definition-increasing method is an interpolation method (i.e., dithering; col. 8 lines 45-58).

It would be obvious to combine the teaching of Allio and Fergason because both Allio and Fergason are directed to providing autostereoscopically displayed images. One of ordinary skill in the art would be motivated to make the combination because Allio displays autostereoscopic images, and Fergason teaches increasing the number of pixels of autostereoscopic images for improved viewing by a person, which is desirable in the art.

As to claim 4, Allio teaches the lower definition is screen definition (col. 4 lines 52-55).

As to claim 5, Allio teaches the high definition autostereoscopic image is generated by generating for each pixel only the color point that is used when generating said autostereoscopic image to be displayed (i.e., per col. 2 lines 54-58, Allio teaches that the color points RGB shine more/less brightly according to the mixing effect in the observer's eye, such that the color points are visible by the color points used).

As to claim 6, Fergason teaches the definition-increasing method is such that it increases definition in the row direction (i.e., the optical line increaser increases both the rows/columns as it can quadruple the effective number of pixels; col. 8 lines 55-65).

As to claim 7, Fergason teaches that the definition-increasing method is such that it increases definition in the column direction (i.e., the optical line increaser increases both the rows/columns as it can quadruple the effective number of pixels; col. 8 lines 55-65).

As to claim 8, Fergason teaches that the high definition autostereoscopic image is obtained from a starting autostereoscopic image by using said definition-increasing method to generate an intermediate autostereoscopic image presenting either p or p-1 times as many rows and p or p-1 times (e.g., double or triple when p=3) as many columns of pixels than the screen (col. 8 lines 59-65), and wherein said high definition autostereoscopic image is obtained by

selecting those pixels in the intermediate autostereoscopic image (i.e., pixels used to increase the pixels presenting output) whose positions correspond to said distribution in space (i.e., located in the space between pixels used to increase the output presented per the interpolation technique).

As to claim 9, Fergason teaches that the lower definition is screen definition, and wherein the method uses said definition-increasing method to generate an intermediate autostereoscopic image of increased definition (i.e., doubled resolution), and then said autostereoscopic image of high definition (i.e., quadrupled resolution; see col. 8 lines 59-65).

As to claim 10, Fergason teaches that wherein p=3 (i.e., in the RGB case as taught by Allio) and wherein said increased definition corresponds to doubling the number of pixels in the row and/or column direction (interpolating between lines; col. 8 line 62).

As to claim 11, Fergason teaches the intermediate autostereoscopic image and/or the high definition autostereoscopic image are generated by computing for each pixel only those color point(s) which are useful (i.e., the color points are useful for viewing output by an observer; col. 8 lines 63-64).

As to claim 12, Fergason teaches that the high definition autostereoscopic image is obtained from a starting autostereoscopic image having either p or p-1 times as many lines and either p or p-1 times as many columns of pixels (i.e., doubling or tripling the number of pixels per col. 8 lines 59-65) than the screen 20, and wherein the high definition autostereoscopic image is obtained by selecting pixels from the starting autostereoscopic image whose positions correspond to said distribution in space (i.e., located in the space between pixels used to increase the output presented per the interpolation technique).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Goldstein et al., U.S. Patent No. 6,396,873, teaches an autostereoscopic device providing a method for enhancing picture resolution by means of color information interpolation.

Jones et al., U.S. Patent No. 6,573,928, teaches an autostereoscopic device wherein the image pixel includes color points from various display pixels spread along a row, for example.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron S. Ward whose telephone number is (703) 305-8992. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven J. Saras can be reached on (703) 305-9720. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASW

DENNIS-DOON CHOW
PRIMARY EXAMINER